998695

SECRET

NPIC/P&DS/D/6-733
20 January 1966

MEMORANDUM FOR: Chief, Support Staff, NPIC

25X1 ATTENTION: [redacted]

SUBJECT: Design Objectives for Circular Slide Rule

REFERENCE: 1. Memorandum PAG/M-995 dated 8 June 1965
2. Suggestion No. 61-533
3. NPIC Project No. 998605

1. In direct response to a requirement of PAG and concurred in by IAD (Ref. 1), a project to procure a circular slide rule was initiated by P&DS. An experimental model of the circular slide rule was obtained 25X1 from [redacted] (Ref. 2), and design objectives were prepared by P&DS in order to solicit proposals from industry.

2. On or about October 1, 1965 a copy of the design objectives and the experimental slide rule were turned over to the Security Branch for scrutiny of operational parameters from a security viewpoint prior to requesting bids from contractors.

3. PAG and IAD are still very interested in this project, and the Suggestion Awards Committee has expressed interest in resolving this matter at an early date.

4. It is requested that the Security Branch return the aforementioned material to P&DS along with approval to keep this project unclassified or offer an alternate plan to handle it within the security requirements.

[redacted] 25X1

Colonel, USAF
Assistant for Plans and Development, NPIC

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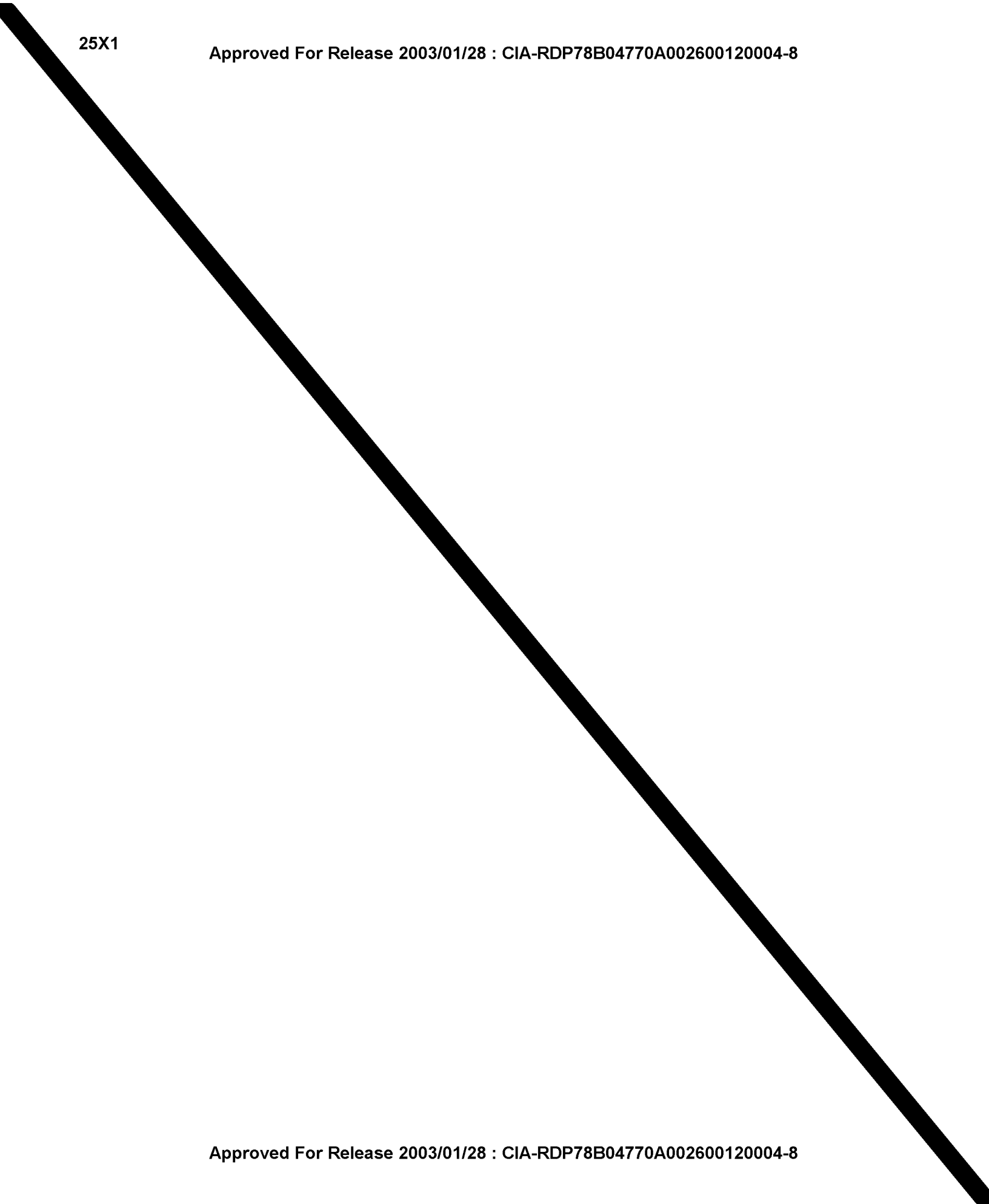
Declass Review by NIMA/DOD

25X1 NPIC/P&DS/DB; [redacted] (17 Jan 66)

SECRET



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Please type in final form and run 20 Xerox

25X1

D R A F T

2 September 1965

DEVELOPMENT OBJECTIVE

AN ADVANCED P.I. CIRCULAR SLIDE RULE

1. INTRODUCTION.

These development objectives describe the design requirements of a circular slide rule. This circular slide rule is planned as a replacement for the present slide rule which fails to satisfy conditions for present day "state-of-the-art" photography.

2. CONCEPT.

This slide rule is intended as a supplemental tool to be used with mensuration values obtained through more sophisticated techniques. The analyst is expected to use this slide rule to further extract information from photographs holding to parameters provided by emnsuration reports.

In field use, with the absence of back up equipment, the analyst can use this slide rule for general purpose mensuration.

3. GENERAL DESCRIPTION.

This circular slide rule shall comprise of an eight (8) inch disc, a six (6) inch disc, and a radial transparent arm. One end of the arm and the centers of the two discs shall be held together with a rivet or other suitable fastener which will allow the three members to turn about this point.

4. REQUIREMENTS.

4.1. SCALES.

4.1.1. Eight Inch Disc. The outer or eight inch disc shall have two spiral scales.

4.1.1.1. Scale I. The outer edge shall have three bands increasing from 1 foot to 1,000,000 feet. This scale will be used for altitude and for ground distance.

4.1.1.2. Scale II. This will be the photo scale and will comprise two bands covering 1000 feet to 1,000,000 feet. This scale will be covered by the six (6) inch disc except for a window indicator.

4.1.2. Six Inch Disc. The inner or six inch disc shall have two spiral scales and one circular scale.

4.1.2.1. Scale II-A. This scale will be in millimeters in either two or three bands covering 0.01mm to 100mm. This scale is for photo distances and is to be located at the outer edge of the six inch disc.

4.1.2.2. Scale II-B. This scale will be located just inside the millimeter scale. It is also for photo distances but is in feet and covers 0.00005 feet to 0.3 feet.

4.1.2.3. Scale IV. This will be a small circular scale at the center of the disc covering 1 inch to 100 inches. This will be used for focal length.

4.2. Indicators.

4.2.1. Radial Transparent Arm. This arm shall pivot about the center point and be long enough to cover the outer extremity

of the large disc. A fine line shall be etched the length of the arm. This line shall be used to line up the photo distance of Scale II with the ground distance of Scale I or the focal length of Scale IV with the altitude of Scale I.

4.2.2. Window Indicator. This shall be of a clear stable material inserted into the six inch disc. A fine line shall be etched across it in the radial direction. The symbol 1: shall be printed at the inside edge of the window on the etched line. This window will display Scale III, the photo scale, when the altitude (Scale I) and focal length (Scale IV) are aligned or when the photo distance (Scale II) and the ground distance (Scale I) are aligned.

4.3. Materials. The contractor shall furnish all material. The arm and window shall be made of a rugged, clear, non-shattering, stable, transparent material. The two discs shall be of a low light reflecting white plastic material. They shall also be non-shattering, somewhat flexible, and stable.

4.4. Printing. The numbers and tick marks of all the scales shall be fine, well marked, non-chipping, and easily read. All except Scale II-A shall be printed in black, Scale II-A shall be printed in red or be red tinted.

4.5. Rivet or Fastener. The selected fastener shall allow smooth rotation of the discs and arm but shall prevent any wobble or play in the motion.

4.6. Instructions. Scale use and operating instructions shall be prepared for each [illegible]

5. REQUEST FOR PROPOSALS

5.1 Circular Slide Rule

It is requested that a bid be submitted for the design and fabrication of six copies of a prototype circular side rule that fulfills the above objectives.

5.2 Circular Slide Rule and Linear Slide Rule

It is further requested that an additional bid be submitted for the design and fabrication of a circular slide rule prototype (6 copies) plus a linear slide rule with folded scales (6 copies). The length of the linear slide shall be limited to approximately one foot and shall be able to manage problems of the same magnitude as the circular slide rule.

B. I. Circular Slide Rule

1. Altitudes and focal length?

2. Is this designed for use on Space Photos?

a. If so do we need measurements up to a foot long.

b. Wouldn't we be better off having a capability (350 ft small …) for small items less than .001' or .3 mm.

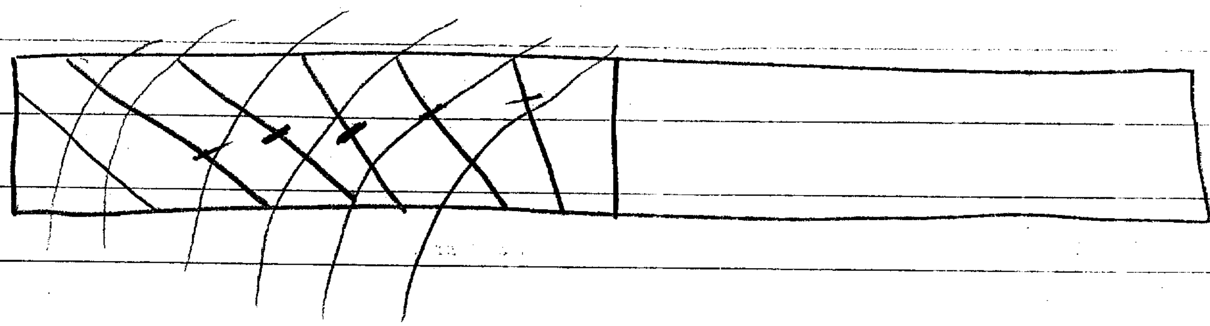
c. Sample only good at nadir.

d. Shouldn't differential scaling be incorporated. Scan and Pitch angles

3. Hasn't Rome done some work on this

4. Outside scale marked from 1 ft to 20,100 ft

5. Six inch lens covers .001 mm to 60 mm
and .00001 ft to .2 ft.



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1,800,000

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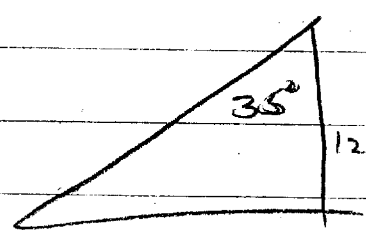

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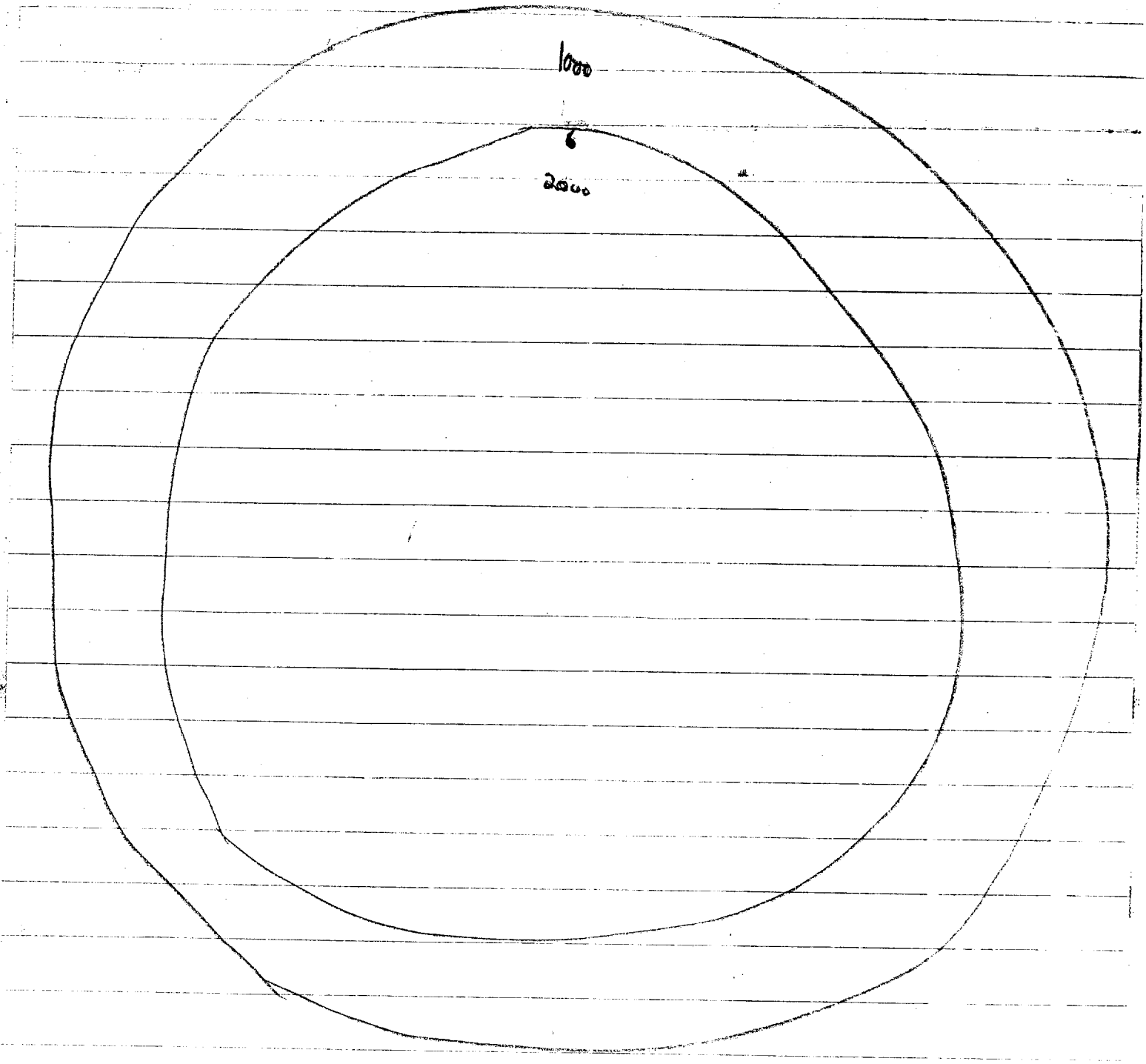

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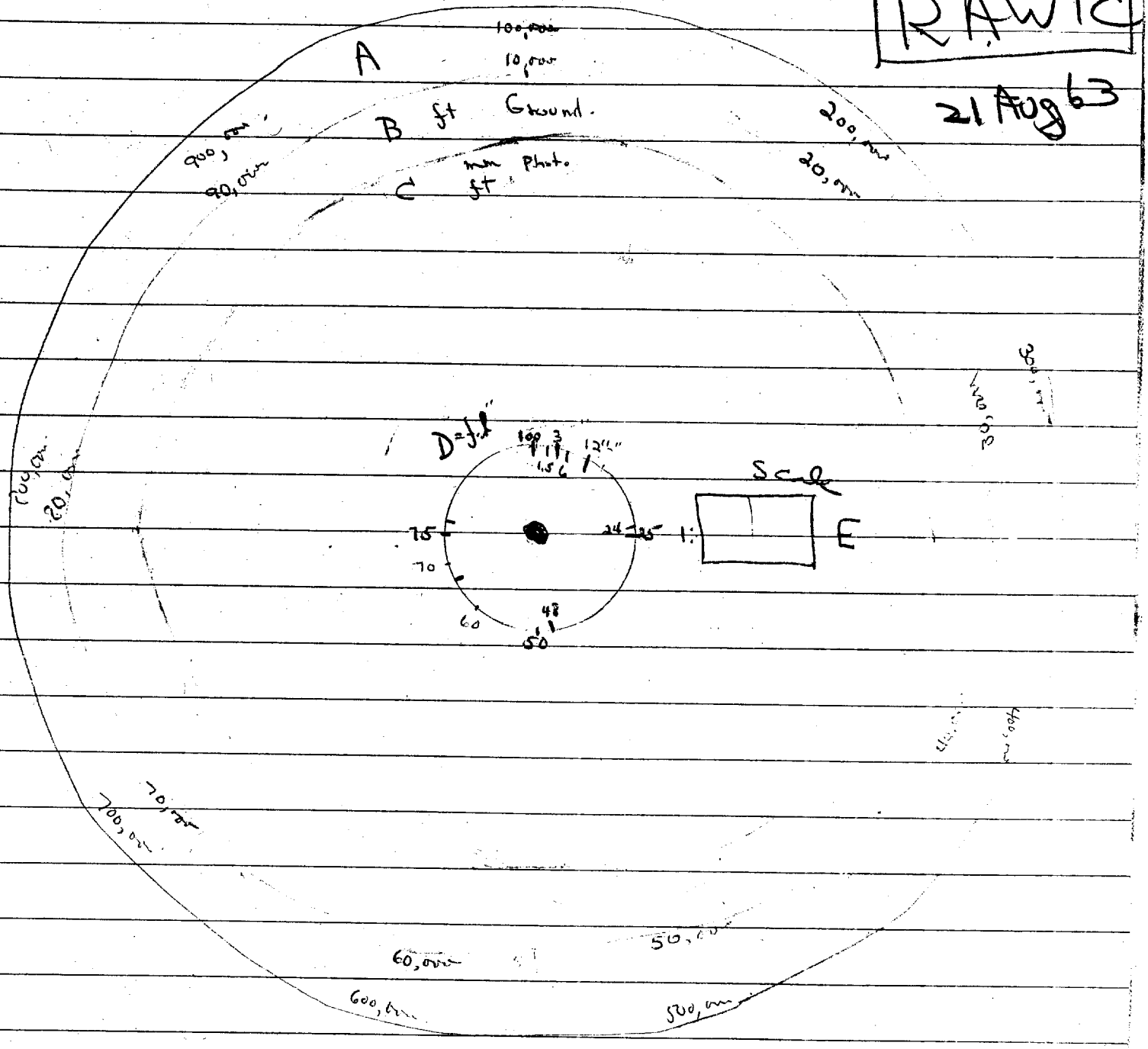
Side I

Long Range Slide Rule

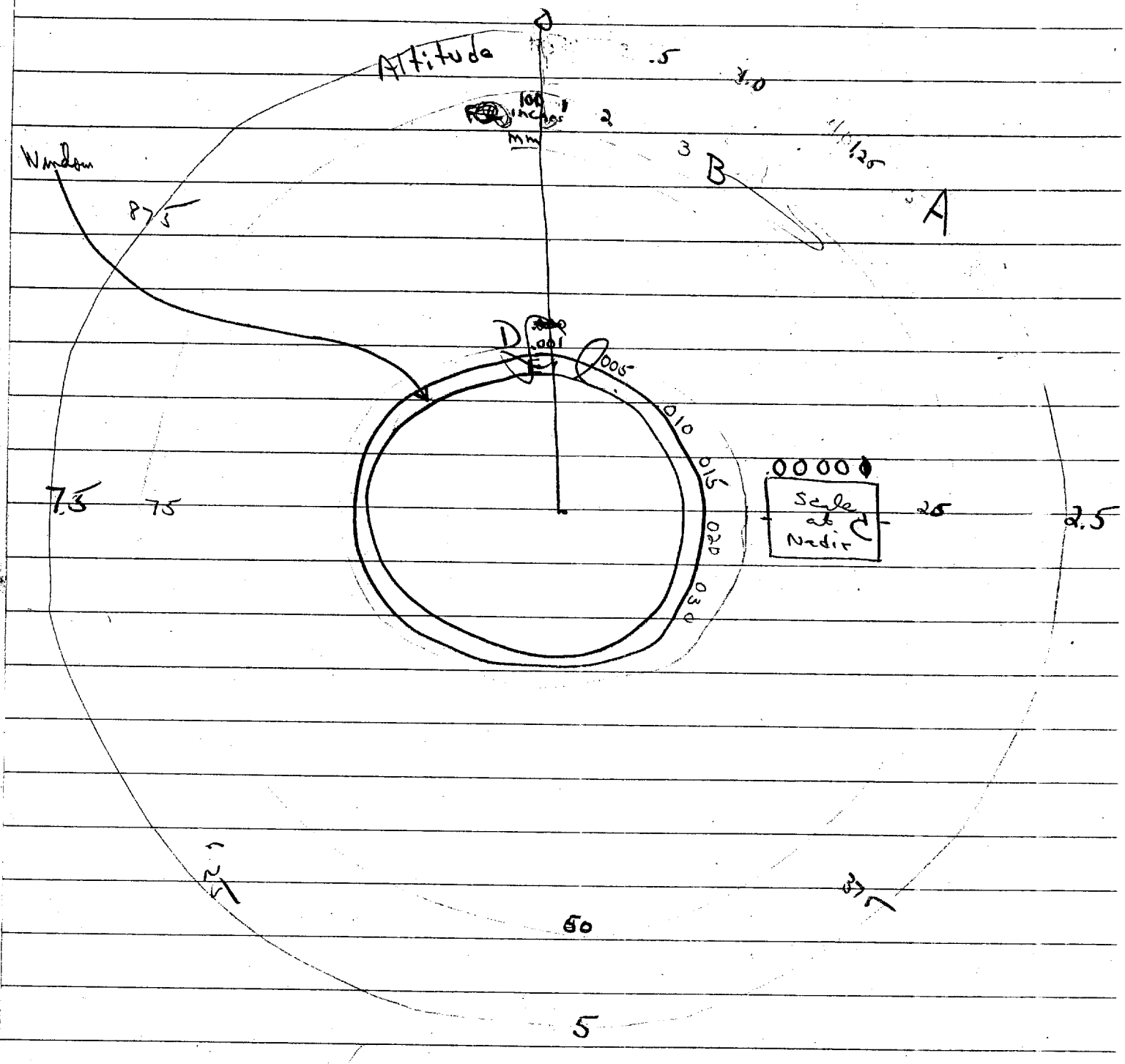
Nov 62

RAWIC

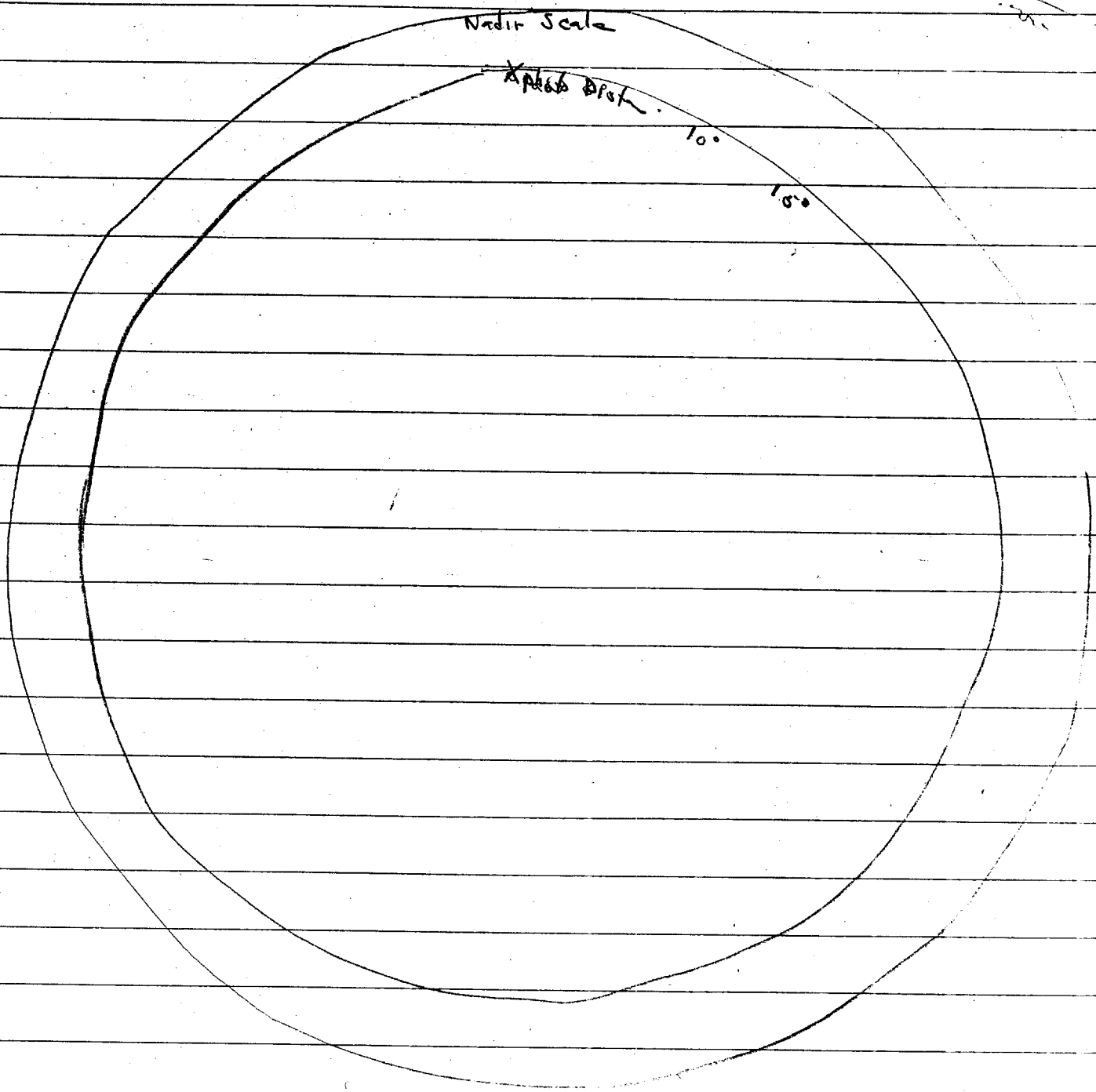
21 Aug 63



Side I



Side II



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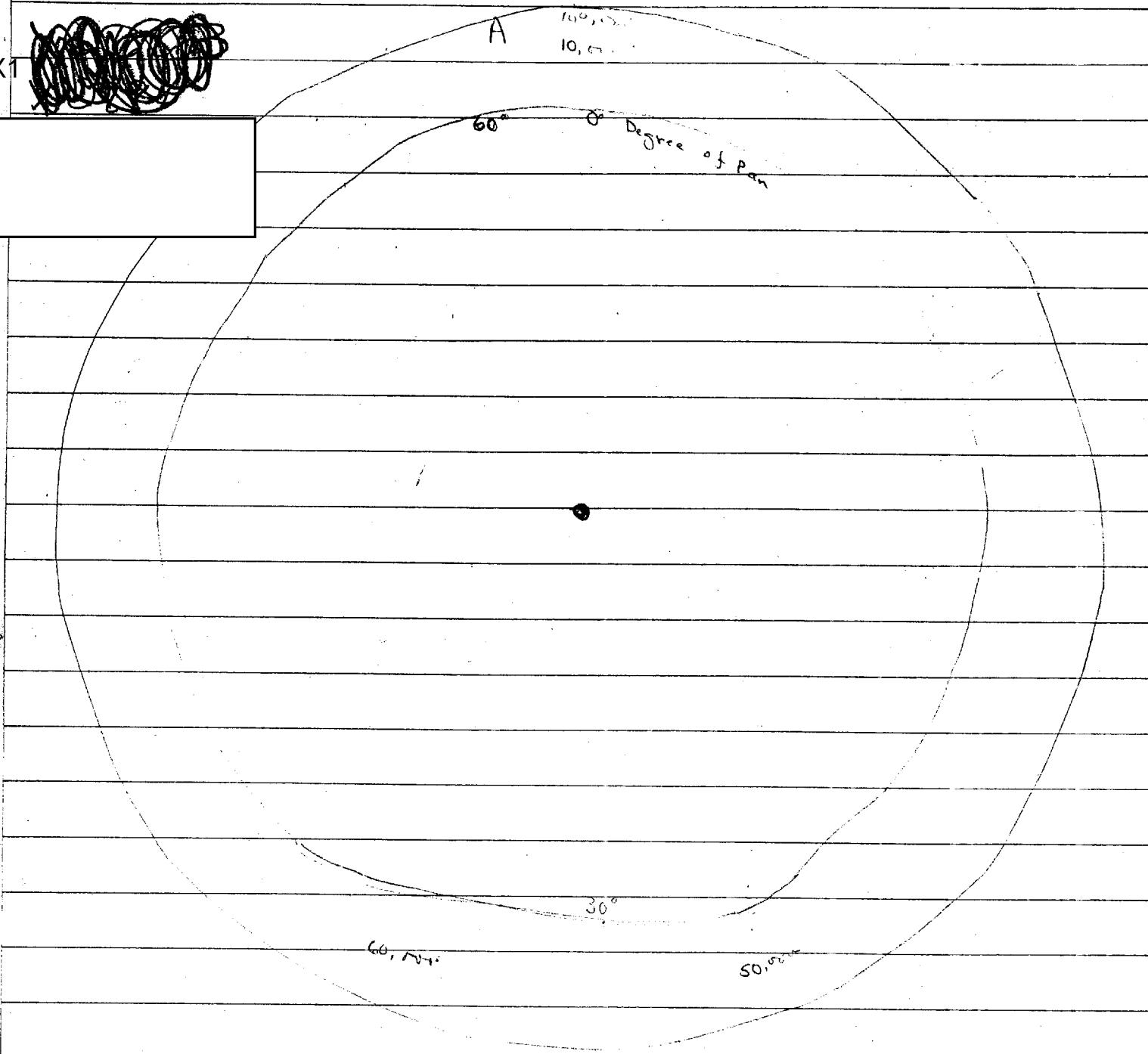
Side II

A = Scale at radius



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